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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/555,475

11/02/2005

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MAT-8762US

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09/08/2008

RATNERPRESTIA

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EXAMINER

DRENNAN, BARRY T

ART UNIT

PAPER NUMBER

4133

MAIL DATE

DELIVERY MODE

09/08/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/555,475	Applicant(s) SUGITA ET AL.	
	Examiner Barry Drennan	Art Unit 4133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/02/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Examiner acknowledges the amendment to claim 9 and the addition of claims 10-16. Claims 1-16 are therefore pending in this Office action.

Priority

2. This application claims priority as a national stage application under the Patent Cooperation Treaty, with effective filing date May 25, 2005, and claims foreign priority of application JP 2004-206933 filed in Japan on July 14, 2004.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: "A Device for Pupil Detection by Measuring Luminance along Concentric Contours".
4. The disclosure is objected to because of the following informality: the phrase "in the status quo" on page 2 line 2 is used in a manner not consistent with common English usage of the term. Examiner suggests replacing the phrase with "is commonplace" or another appropriate phrase.

Claim Objections

5. Claims 9-16 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

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Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The phrase "iris authentication apparatus" is a mere statement of intended use which does not further limit claims 9-16, and the claims do not otherwise distinguish themselves from parent claims 1-8.

6. Claims 1 and 8 are objected to because of the following informalities: In claim 1, the word "an" should be stricken from the phrase "and extracting an image data of the eye image" in the first subparagraph. Also in claim 1, the word "that" should be stricken from the phrase "for detecting that the center coordinates" in the fourth subparagraph. In claim 8, the word "to" should be inserted in the phrase "which points to the center coordinates of the integrating circle". Appropriate correction is required.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1 and 9 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 3 and 6, respectively, of U.S. Patent No. 7,347,547 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because all of the limitations in claims 1 and 9 of the application are present and anticipated in claims 3 and 6 of the aforementioned patent, respectively. Note that even though claim 1 of the application omits the limitations related to the luminance difference calculation unit, it has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before (*In re Karlson*, 136 USPQ 184 (CCPA). Also note *Ex parte Raine*, 168 USPQ 375 (Bd. App. 1969): omission of a reference element whose function is not needed would be obvious to one skilled in the art.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 4-6, 8, 9, 12-14, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Okano et al. (US Patent 6,144,754, issued November 7, 2000, hereinafter "Okano").

11. With respect to claim 1, Okano discloses:

A pupil detection device comprising:

an image data extraction unit for determining a plurality of circles on an eye image as integrating circles respectively, and extracting an image data of the eye image positioned on the circumferences of the integrating circles (implicitly arising from “image storage unit 11 [which] stores eye images” and “ellipse preparation unit 12 [which] prepares a plurality of ellipses”, col. 3, lines 55 and 64-65);

a contour integrating unit integrating the image data extracted by the image data extraction unit along the respective circumferences of the integrating circles (“pixel addition unit 13 [which] sums up values of pixels corresponding to the circumference of each of the ellipses”, col. 4, lines 12-13);

a pupil radius detection unit for detecting that an integrated value obtained by the contour integrating unit has changed stepwise with respect to the radius of the integrating circle (“ellipse selection unit 14 [which] selects two ellipses” and “judges whether the ellipse[s]... are representative of the boundary between the pupil and the iris, based upon the pixel sums”, col. 4, lines 18-23);

a pupil position detection unit for detecting that the center coordinates of the integrating circle as pupil position coordinates when the pupil radius detection unit detects the stepwise change (“boundary decision unit 15 [which] decides that the ellipses... are representative of the boundary of the pupil and the iris

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pursuant to the judgment of the ellipse selection unit 14” and “provides the parameters for defining [said] ellipses”, col. 4, lines 24-29),

wherein the plurality of circles are set concentrically (“As shown in Figure 3, both the ellipses... have a common center”, col. 4, lines 33-34), and the image data extraction unit extracts the plurality of image data simultaneously (“In addition to the difference [obtained by subtracting the total value along one ellipse from that of another ellipse], n times repetition gives other differences [from between the remaining ellipses]” and “the ellipse selection unit 14 and the pixel addition unit 13 provide a plurality of differences with respect to sums of pixels of the circumferences of the plurality of ellipses”, col. 4, lines 52-58).

12. With respect to claim 4, Okano discloses:

The pupil detection device of claim 1, wherein the image data extraction unit comprises: a partial frame memory, the partial frame memory comprising: a plurality of line memories of first-in first-out (FIFO) type being connected, and drawing lines for drawing image data corresponding to pixels on the respective circumferences of the plurality of concentric integrating circles (implicitly arising from “the image storage unit 11, the ellipse preparation unit 12, the pixel addition unit 13, the ellipse selection unit 14, and the boundary decision unit 15, [for which] programming or software is available. Therefore, the individual identification system may incorporate a personal computer...” col. 4, line 65, through col. 5, line 4).

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13. With respect to claim 5, Okano discloses:

The pupil detection device of claim 4 comprising a pointer unit for indicating center coordinates of the integrating circle, the pointer unit comprising a counter for counting a clock synchronized with a period for acquiring the image data on the partial frame memory (arising from the general purpose computer mentioned at col. 4, line 65, through col. 5, line 4; "The ellipse preparation unit changes a center (X_c , Y_c)... within respective given ranges with the minimum value, the maximum value, and the step as follows... range of X_c : from X_{min} to X_{max} by ΔX ... range of Y_c : from Y_{min} to Y_{max} by ΔY ", col. 5, lines 19-36; and the boundary decision unit 15 at col. 4, lines 24-31).

14. With respect to claim 6, Okano discloses:

The pupil detection device of claim 1, wherein the contour integrating unit comprises a plurality of adders for adding the image data extracted by the image data extraction unit along the respective circumferences of the integrating circles (arising from the general purpose computer mentioned at col. 4, line 65, through col. 5, line 4; and the pixel addition unit 13 at col. 4, lines 12-17).

15. With respect to claim 8, Okano discloses:

The pupil detection device of claim 5, wherein the pupil position detection unit comprising a register, the register being configured in such a manner that when the pupil radius detection unit detects the radius of the integrating circle as the radius of the pupil, the counter output from the pointer unit which points the center coordinates of the

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integrating circle in question is held as the pupil position coordinates (arising from the general purpose computer at col. 4, line 65, through col. 5, line 4; the ellipse preparation unit 12 at col. 3, line 64, through col. 4, line 11, describing that "[t]he typical parameters are a center..."; the boundary decision unit 15 at col. 4, lines 24-31, describing that "the boundary decision unit 15 provides the parameters for defining the ellipses"; and "the center coordinate... of the ellipse corresponding to the resultant difference [is] stored", col. 7, lines 42-44).

16. With respect to claims 9, 12-14, and 16, Okano discloses:

An iris authentication apparatus comprising the pupil detection device of Claim [1, 4, 5, 6, or 8] (the device previously discussed is part of an "apparatus for identifying individuals based upon iris textures extracted from images of individuals' eyes" at col. 1, lines 7-9).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 2, 3, 7, 10, 11, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okano as applied to claim 1 above, and further in view of Cleveland et al. (US Patent 5,231,674, issued July 27, 1993, hereinafter "Cleveland").

19. With respect to claim 2, Okano calculates the difference value between the total pixel sums of two of the concentric ellipses and determines that the pupil-iris boundary lies where this difference is greatest from among all the pixel sums compared, but does not compare this difference to a separate predetermined threshold.

However, Cleveland discloses that “a common method in the image processing field for finding an object known to be either brighter or darker than its background is to set an intensity threshold value somewhere between the intensities of the object and its background and to search the image for a contour of pixels whose intensity crosses the threshold” (col. 8, lines 7-26).

Therefore, it would have been obvious to one ordinarily skilled in the art at the time the invention was made to combine the device of Okano with the thresholding procedure of Cleveland, because “the spikes [from differentiating the smoothed intensity level across the eye image] are significantly easier to detect with an amplitude thresholding procedure” (Cleveland, col. 12, lines 3-5).

20. With respect to claim 3, as mentioned above, Okano does not use the thresholding procedure disclosed by Cleveland, and so does not specify a threshold value. However, Cleveland discloses that “the threshold for detecting the pupil is generally set to a value about midway between the average iris intensity and the average pupil intensity” (col. 8, lines 23-25), a value which lies between $\frac{1}{4}$ to 1 times the

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difference between the integrated (or averaged) value when an integrating circle is located on the iris versus the pupil.

An example from the prior art anticipates a range if it lies within that range (Titanium Metals Corp. v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the anticipated range when combining the device of Okano with the thresholding procedure of Cleveland, for the same reasons discussed in the rejection of claim 2 above.

21. With respect to claim 7, Okano discloses a subtractor for calculating a difference value between the integrated values of the two integrating circles having the closest radius out of the plurality of concentric integrating circles (the general purpose computer discussed at col. 4, line 65, through col. 5, line 4, and the ellipse selection unit which "acquires the difference between the total values of the pixels along the circumference of the [first] ellipse and... the [second] ellipse" at col. 4, lines 48-51). Okano also discloses a register for holding the radius of the integrating circle (the general purpose computer above, and "the center coordinate, inclination, ratio, and line of apsides corresponding to the resultant difference... are stored" at col. 7, lines 42-44) and a comparator (the general purpose computer above). Okano does not disclose using the comparator to compare the difference value obtained from the subtractor against a predetermined threshold or using the result of that comparison to determine whether or not to store a value in the register.

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However, Cleveland discloses the use of a threshold (col. 8, lines 7-26) to determine the location and dimensions of the pupil. The use of a threshold inherently requires the use of a comparator to compare a value against the threshold.

Therefore, it would have been obvious to one ordinarily skilled in the art at the time the invention was made to use the comparator and register disclosed by Okano to compare the ellipse pixel sums disclosed by Okano against the threshold disclosed by Cleveland, and to use that result to determine whether or not to store the ellipse configuration in the register disclosed by Okano, for the same reasons discussed in the rejection of claim 2 above.

22. With respect to claims 10, 11, and 15, Okano discloses an iris authentication apparatus (col. 1, lines 7-9). As all further limitations present in these claims are already disclosed by Okano, they would be obvious to one ordinarily skilled in the art at the time the invention was made, under the rationales discussed for preceding claims 2, 3, and 7.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Daugman, John G., US Patent 5,291,560 A, directed toward a system for analyzing an eye image to retrieve and authenticate iris data.

Hay et al. US Patent 6,095,989 A, directed toward a method of locating eyes and eye components in an image.

Tisse et al., US Pre-Grant Publication 2003/0076984 A1, directed toward the coding of data along concentric rings in an image.

Kondo, et al., US Pre-Grant Publication 2003/0118217 A1, directed toward the detection of eye position within an image.

Inagaki et al., US Patent 6,621,928 B1, directed toward the detection of edges within an image.

Boles, W.W., et al. "A human identification technique using images of the iris and wavelet transform." IEEE Transactions on Signal Processing, April 1998, Vol. 46 No. 4, pp. 1185-1188, directed toward a system for analyzing an eye image to retrieve and authenticate iris data.

Sung, K.J., et al. "A video eye tracking system based on a statistical algorithm." Proceedings of the 36th Midwest Symposium on Circuits and Systems, 1993, Vol. 1 pp. 438-441, directed toward the detection of eye position in an image.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry Drennan whose telephone number is 571-270-7262. The examiner can normally be reached on Monday through Thursday and alternate Fridays from 7:30am to 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Abul Azad can be reached on 571-272-7599. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Barry Drennan/
Examiner, Art Unit 4133

/ABUL AZAD/
Supervisory Patent Examiner, Art Unit 4133